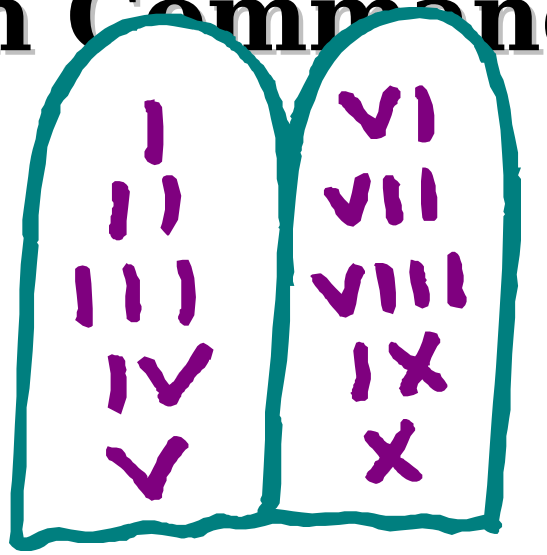
Weapons of Mass Destruction Management of Bio & Chem Casualties: The Ten Commandments



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I. Thou shalt Maintain an Index of Suspicion

Chemical Warfare Diseases

- Suspicion usually easy
- Casualties clustered in time and space
- Absence of explosive device

Index of Suspicion:
The Problem of Chem vs Bio

- Chemical
  - Device goes off….
  - Everyone falls down.
  - Tight casualty cluster
  - First Responders
    - Fire
    - Police
    - Paramedic
- Biological
  - Device goes off….
  - No one realizes it.
  - Casualties disperse
  - Present days later
  - First Responders
    - Medical

Biological Warfare Diseases

Diagnostic Associations

Agent	Association
Anthrax	Wide Mediastinum
Plague	Hemoptysis*
Smallpox	Exanthem
Botulism	Flaccid Paralysis*

*when seen in multiple patients on the battlefield

Biological Warfare Diseases

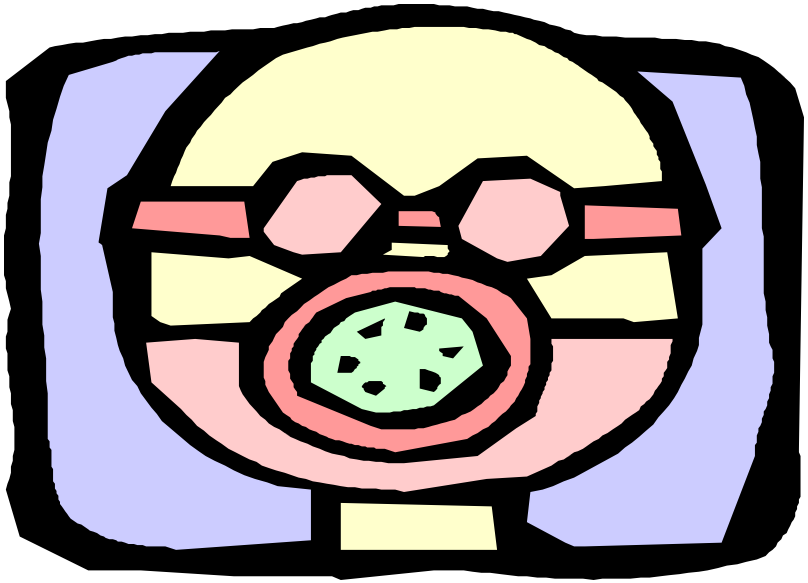
Non-Specific Febrile Presentations

- Tularemia
- Brucellosis
- Q Fever
- VEE
- Prodromal Plague
- Prodromal Anthrax
- Prodromal Smallpox

Chemical or Biological Warfare? Epidemiologic Clues

- Tight Cluster of Casualties
- High Infection Rate
- Unusual Geography
- Localized Geography
- Unusual Clinical Presentation
- Point Source or Multiple Point Sources
- Unusual Munitions
- Dead Animals
- Lower Attack Rates in Protected

II. Thou shalt Protect Thyself



Protection Against BW & CW

- Physical
  - MOPP gear
  - SERPACWA
- Chemical
  - pre- & post-exposure antibiotics
  - pyridostigmine bromide
- Immunologic
  - passive (e.g. Botulinum antitoxin)
  - active (e.g. Anthrax & Vaccinia vaccines)

BSL-3 Pathogens

- Anthrax
- Plague
- Tularemia
- Brucellae
- Q-Fever
- Glanders
- Melioidosis
- Alphaviruses (VEE, WEE, EEE)

BSL-4 Pathogens

- Filoviridae
  - Ebola
  - Marburg
- Arenaviridae
  - Lassa
  - Guanarito
  - Junin
  - Machupo
  - Sabia
- Flaviviridae
  - RSSE & CEE
  - TBE Complex
  - Kyasanur Forest
  - Omsk
- Bunyaviridae
  - CCHF
- Orthopoxviruses
  - Variola

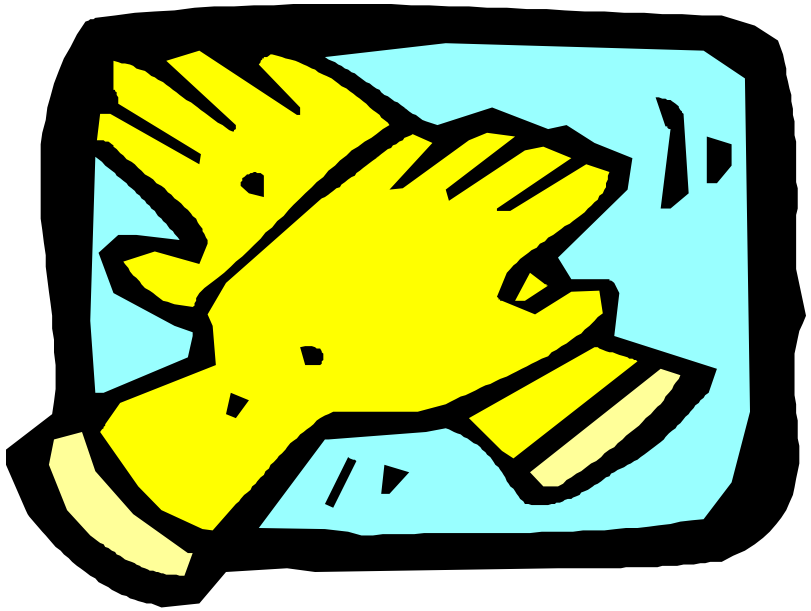
III. Thou shalt Assess the Patient

(The Primary Survey)

Initial Patient Assessment

- Airway
  - MUSTARD, LEWISITE, PHOSGENE OXIME
- Breathing
  - ANT, PLA, TUL, BOT, SEB, QF, RICIN
  - CYANIDE, NERVE, PHOSGENE
- Circulation
  - PLA, VHF
  - CYANIDE
- Disability- Neuromuscular?
- Exposure- Need for Decon?

IV. Thou shalt Decontaminate as Appropriate



Decontamination after a Chemical Attack

- Materiel:
  - ? 5.0% Hypochlorite
- Personnel
  - ? 0.5% Hypochlorite
  - Soap & Water
- Which agents require Decon?
  - VX, ? other nerve agents
  - Mustard & Lewisite
  - ? Phosgene

Microbial Elimination Terminology

- Sterilization
  - elimination of all microbial life
- Disinfection
  - high-level disinfectants
    - kill all except high levels of endospores
  - intermediate-level disinfectants
    - kill tubercle bacilli, vegetative bacteria, viruses
  - low-level disinfectants

Decontamination (Disinfection) after a Biological Attack

- Personnel
  - decon rarely needed
  - less relevant than for Chem attack
  - soap & water
  - use common sense
- Materiel
  - often unnecessary
  - less relevant than for Chem attack
  - 5.0% bleach more than adequate
  - 0.1% bleach kills anthrax spores

V. Thou shalt Establish a Diagnosis
(The Secondary Survey)

“AMPLE” History

- Allergies, Arthropods
- Medications, MOS, MOPP Status
- Past Illnesses/Immunizations
- Last Meal, Food Procurement
- Environment
  - events on battlefield
  - travel history
  - other unit members
  - munitions

Physical Exam

- **Respiratory**
- **Neuromuscular**
  - central & peripheral
- Hematologic/Vascular
- Dermatologic

Obtaining Specimens

- CBC, ABG
- Nasal Swabs (culture, PCR)
- Blood for Bacterial Culture, PCR
- Serology
- Sputum Bacterial Culture
- Toxin Assays (blood, urine)
- Throat Swab (viral culture, PCR, ELISA)
- Environmental Samples?

VI. Thou shalt Render Prompt Treatment

Field Inpatient Therapy
Chemical & Biological Casualties

- Immediate Pulm
  - SEB
  - Mustard
  - Lewisite
  - Phosgene
  - Cyanide
- Immediate Neuro
  - Nerve Agents
  - Cyanide
- Delayed Pulm
  - Anthrax
  - Plague
  - Tularemia
  - Q Fever
  - SEB, Ricin
  - Mustard, Lewisite
  - Phosgene
- Delayed Neuro
  - Botulism
  - VEE (CNS)

Therapy
Chemical & Biological Casualties
Specific Therapy Available & Advisable

- Immediate Pulm
  - Cyanide
- Immediate Neuro
  - Nerve Agent
- Delayed Pulm
  - Anthrax
  - Plague
  - Tularemia
  - Q Fever
- Delayed Neuro
  - Botulism

Biological Warfare Diseases

Non-Specific Febrile Presentations

Agent	Treatment
Tularemia	Doxy or Gent
Brucellosis	Doxycycline
Q-Fever	Doxycycline
Prodromal Plague	Doxy or Gent
Prodromal Anthrax	Doxy or Cipro
VEE	None

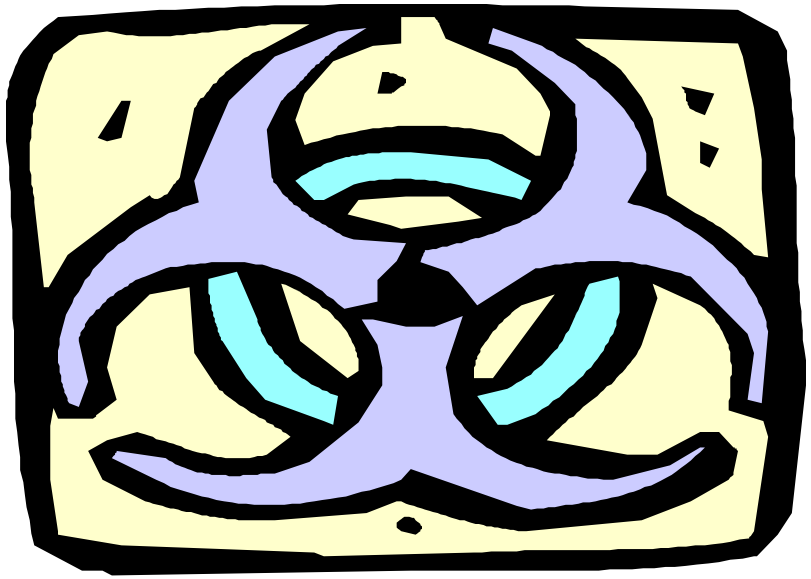
Field Expedient Therapy

Chemical & Biological Casualties

Therapy Based on Syndrome Type

- Immediate Pulm
  - Cyanide Kit
- Delayed Pulm
  - Doxycycline
- Immediate Neuro
  - NAAK
- Delayed Neuro
  - Bot Antitoxin
  - (Rx at Echelon II)

VII. Thou shalt Practice Good Infection Control



Isolation Precautions
in Hospitals

- Standard Precautions (UP + BSI)
- Transmission-Based Precautions
  - Airborne Precautions
  - Droplet Precautions
  - Contact Precautions

Airborne Precautions

- Measles
- Varicella
- Pulmonary Tuberculosis

Droplet Precautions

- Invasive H flu B Disease
- Invasive Meningococcal Disease
- Drug-Resistant Pneumococcal Disease
- Diphtheria, Pertussis, Mycoplasma, GABHS, Pneumonic Plague
- Adenovirus, Mumps, Rubella, Influenza, Parvovirus B19

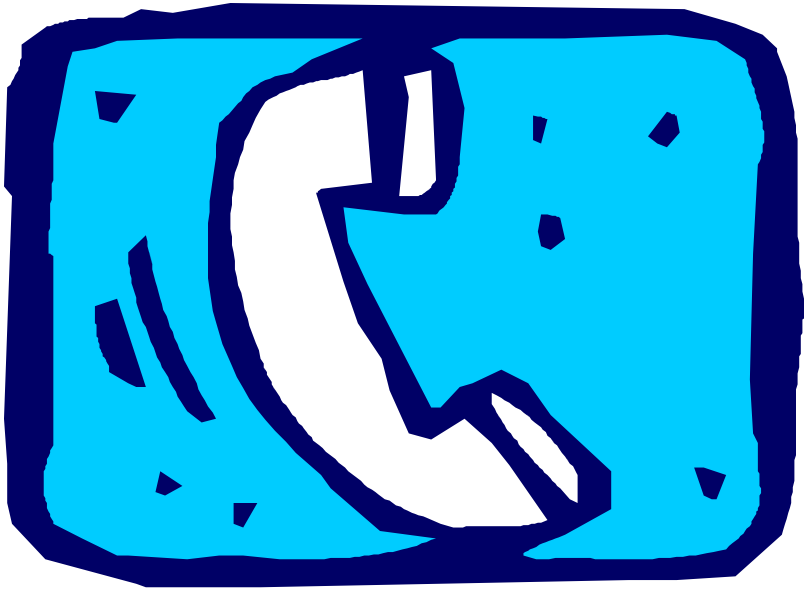
Contact Precautions

- Certain Drug Resistant Pathogens (MRSA, VRE)
- C. difficile
- Enterics in incontinent host:
  - O157:H7, Shigella, Hepatitis A, Rotavirus
- RSV, Parainfluenza, Enterovirus
- Skin Infections:
  - HSV, Impetigo, Lice, Scabies, SSSS, Draining Abscesses, etc
- Hemorrhgic Conjunctivitis
- VHFs

Isolation Precautions
Biowarfare Diseases

- Pneumonic Plague
  - Droplet Precautions
- Smallpox
  - ? Airborne Precautions
  - “Strict Quarantine”
- Viral Hemorrhagic Fevers
  - Contact Precautions

VIII. Thou shalt Alert the Proper Authorities



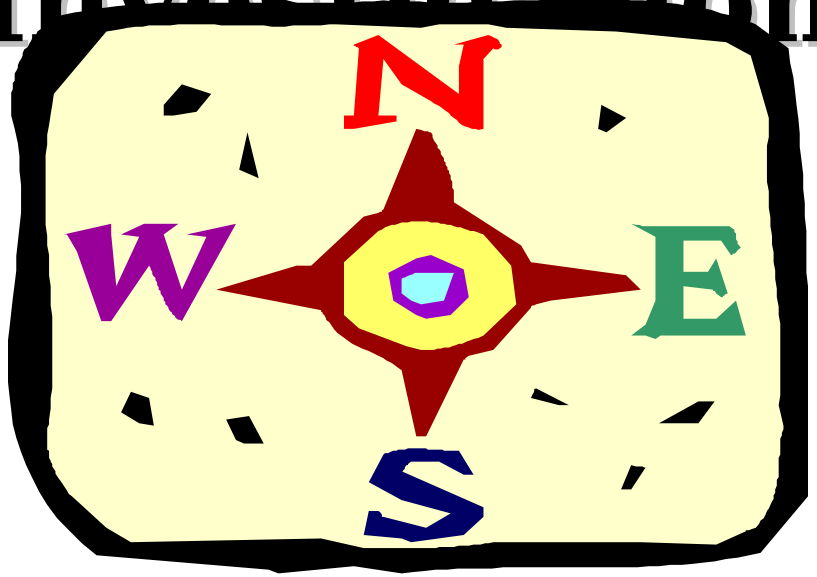
Who to Alert?

- The COMMAND
- Preventive Medicine Personnel
- Chemical Corps Personnel
- Laboratory

Notifiable Diseases
CDC Data, 1992-1996

	1992	1993	1994	1995	1996
Anthrax	1			*	*
Botulism	91	97	143	97	119
Brucella	105	120	119	98	112
Plague	13	10	17	9	5
Tularemia	159	132	96	*	*
Typhoid	414	440	441	369	396

IX. Thou shalt Conduct an Epidemiological Investigation



The Epidemiological Sequence

- 1. Observation
- 2. Count Cases
- 3. Relate Cases to Population
- 4. Make Comparisons
- 5. Develop the Hypothesis
- 6. Test the Hypothesis
- 7. Make Scientific Inferences
- 8. Conduct Studies
- 9. Intervene and Evaluate

Preventive Medicine Assets in the Field

- Preventive Medicine Officer
- Field Sanitation Teams
- 91S- Epidemiology Technician
- Environmental Science Officer
- Veterinary Officer

Public Health Assets in the Field

- Local/County Health Departments
- State Health Departments
- Centers for Disease Control
- Public Health Veterinarians
- Infectious Disease Society of America

X. Thou shalt Know and Spread the Gospel

How to Contact Us?

- USAMRIID
  - www.usamriid.army.mil
- USAMRICD
  - www.ccc.apgea.army.mil
- AFRRI
  - www.afrri.usuhs.mil

24-Hour Emergency Response Numbers

- 1-888-USARIID
  - HOT ZONE
  - “Bio Incident Line”
- 1-800-USARIID
  - HOTTER ZONE
  - “Hot Live Talk”